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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,801	06/13/2005	Jung_Il Byun	11281-072-999	8805

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EXAMINER	
GOFF II, JOHN L	

ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
12/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/538,801	BYUN ET AL.	
	Examiner	Art Unit	
	John L. Goff	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/13/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-6 and 8-10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Suga et al. (EP1093160).

Suga discloses an anisotropic-electroconductive adhesive comprising an insulating adhesive component containing a radical polymerizable compound and a polymerization initiator

and a plurality of insulating coated electroconductive particles dispersed in the insulating adhesive component wherein the insulating coated electroconductive particles have a coating layer made of insulating thermoplastic resin on a surface of the electroconductive particles (Paragraphs 0013-0015, 0019, 0022, 0023, and 0060). Suga teaches the adhesive is interposed between facing electrodes of two circuit boards and thermally pressed to melt and remove at least part of the insulating coating of the electroconductive particles to electrically connect the faced circuit electrodes and to cure the insulating adhesive component so that the circuit electrodes are adhered and fixed (Figure 1 and Paragraphs 0022, 0039, 0040, and 0046).

Regarding the limitation "wherein a softening point of the insulating thermoplastic resin is lower than an exothermic peak temperature of the insulating adhesive component" it is noted applicants specification describes "If the softening point of the insulating thermoplastic resin composing the coating layer 152 formed on the electroconductive particle 151 is higher than the exothermic peak temperature of the insulating component 140, the insulating adhesive component 140 will be cured before the coating 152 is softened, so the coating layer which is contacted with the circuit electrodes 11 and 21 in the pressure direction are not removed, thereby causing a short circuit" (Page 15, lines 2-8). Thus, because Suga teaches the insulating coating of the electroconductive particles is melted and removed before the insulating adhesive component is cured (Paragraphs 0022 and 0040) inherently the softening point of the insulating thermoplastic resin is lower than an exothermic peak temperature of the insulating adhesive component. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the softening point of the insulating thermoplastic resin is lower than an exothermic peak temperature of the insulating adhesive component taught by Suga

otherwise the insulating coating would remain and there would be no electrical interconnection formed as required.

Regarding claim 2, Suga teaches a curing initiation temperature for the insulating adhesive component in the range of 80 to 150 °C considered the exothermic peak temperature (Paragraph 0015). Regarding claim 3, Suga teaches the coating layer made of the insulating thermoplastic resin has a thickness of 0.05 to 2 μm (Paragraph 0024). Regarding claim 4, Suga teaches the electroconductive particle is made by forming a metal thin layer onto a surface of a nucleus material (Paragraph 0019). Regarding claim 5, Suga teaches the insulting adhesive component further includes thermosetting resin and a curing agent (Paragraphs 0013-0015). Regarding claim 6, Suga teaches acrylate based compounds (Paragraph 0013). Regarding claim 8, Suga teaches the insulating adhesive component further includes thermoplastic resin (Paragraph 0016).

Claim Rejections - 35 USC § 103

5. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suga in view of Tsukagoshi et al. (U.S. Patent 6,158,115).

Suga discloses an anisotropic-electroconductive adhesive comprising an insulating adhesive component and a plurality of insulating coated electroconductive particles dispersed in the insulating adhesive component wherein the insulating coated electroconductive particles have a coating layer made of insulating thermoplastic resin on a surface of the electroconductive particles. Suga teaches the adhesive is interposed between facing electrodes of two circuit boards, e.g. an IC chip and an IC board and thermally pressed to melt and remove at least part of

the insulating coating of the electroconductive particles to electrically connect the faced circuit electrodes and to cure the insulating adhesive component so that the circuit electrodes are adhered and fixed. Suga does not specifically teach the insulating adhesive component comprises an acrylate based radical polymerizable compound and an organic peroxide polymerization initiator. Suga does teach there may be used without restriction any kind of resin capable of curing (Paragraph 0013). Tsukagoshi discloses an anisotropic-electroconductive adhesive comprising an insulating adhesive component containing a radical polymerizable acrylate based compound and a radical peroxide, i.e. considered organic peroxide, polymerization initiator and a plurality of insulating coated electroconductive particles dispersed in the insulating adhesive component wherein the insulating coated electroconductive particles have a coating layer made of insulating resin on a surface of the electroconductive particles (Column 10, lines 18-33 and Column 11, lines 28-39). Tsukagoshi teaches the adhesive is interposed between facing electrodes of two circuit boards and thermally pressed to electrically connect the faced circuit electrodes and to cure the insulating adhesive component so that the circuit electrodes are adhered and fixed (Figure 6B and Figure 8 and Column 9, lines 65-67 and Column 10, lines 1-17). Tsukagoshi teaches the insulating adhesive component is preferred because it has a short set time, improves the efficiency of the connection, and has excellent adhesive properties (Column 10, lines 18-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the insulating adhesive component taught by Suga the insulating adhesive component taught by Tsukagoshi which has a short set time, improves the efficiency of the connection, and has excellent adhesive properties.

Regarding the limitation "wherein a softening point of the insulating thermoplastic resin is lower than an exothermic peak temperature of the insulating adhesive component" it is noted applicants specification describes "If the softening point of the insulating thermoplastic resin composing the coating layer 152 formed on the electroconductive particle 151 is higher than the exothermic peak temperature of the insulating component 140, the insulating adhesive component 140 will be cured before the coating 152 is softened, so the coating layer which is contacted with the circuit electrodes 11 and 21 in the pressure direction are not removed, thereby causing a short circuit" (Page 15, lines 2-8). Thus, because Suga teaches the insulating coating of the electroconductive particles is melted and removed before the insulating adhesive component is cured (Paragraphs 0022 and 0040) intrinsically the softening point of the insulating thermoplastic resin is lower than an exothermic peak temperature of the insulating adhesive component. In the event it is shown that this is not necessarily true the following rejection would apply. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the softening point of the insulating thermoplastic resin is lower than an exothermic peak temperature of the insulating adhesive component taught by Suga as modified by Tsukagoshi otherwise the insulating coating would remain and there would be no electrical interconnection formed as required.

Regarding claim 2, Tsukagoshi teaches the exothermic peak temperature of the insulating adhesive component in the range of 50 to 150 °C (Column 10, lines 55-67). Regarding claim 3, Suga teaches the coating layer made of the insulating thermoplastic resin has a thickness of 0.05 to 2 μm. Regarding claim 4, Suga teaches the electroconductive particle is made by forming a metal thin layer onto a surface of a nucleus material. Regarding claim 5, Suga as modified by

Tsukagoshi teach the insulting adhesive component further includes thermosetting resin and a curing agent. Regarding claim 8, Suga teaches the insulating adhesive component further includes thermoplastic resin (Paragraph 0016).

6. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukagoshi in view of Suga.

Tsukagoshi discloses an anisotropic-electroconductive adhesive comprising an insulating adhesive component containing a radical polymerizable acrylate based compound and a radical peroxide, i.e. considered organic peroxide, polymerization initiator and a plurality of insulating coated electroconductive particles dispersed in the insulating adhesive component wherein the insulating coated electroconductive particles have a coating layer made of insulating resin on a surface of the electroconductive particles. Tsukagoshi teaches the adhesive is interposed between facing electrodes of two circuit boards and thermally pressed to electrically connect the faced circuit electrodes and to cure the insulating adhesive component so that the circuit electrodes are adhered and fixed. Tsukagoshi does not teach the coating layer made of insulating resin is thermoplastic. Suga discloses an anisotropic-electroconductive adhesive comprising an insulating adhesive component and a plurality of insulating coated electroconductive particles dispersed in the insulating adhesive component wherein the insulating coated electroconductive particles have a coating layer made of insulating thermoplastic resin on a surface of the electroconductive particles. Suga teaches the adhesive is interposed between facing electrodes of two circuit boards, e.g. an IC chip and an IC board and thermally pressed to melt and remove at least part of the insulating coating of the electroconductive particles to electrically connect the faced circuit electrodes and to cure the insulating adhesive component so that the circuit

electrodes are adhered and fixed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the coating layer made of insulating resin taught by Tsukagoshi a thermoplastic as was known as suitable in the same art for forming insulating coating electroconductive particles as shown by Suga.

Regarding the limitation "wherein a softening point of the insulating thermoplastic resin is lower than an exothermic peak temperature of the insulating adhesive component" it is noted applicants specification describes "If the softening point of the insulating thermoplastic resin composing the coating layer 152 formed on the electroconductive particle 151 is higher than the exothermic peak temperature of the insulating component 140, the insulating adhesive component 140 will be cured before the coating 152 is softened, so the coating layer which is contacted with the circuit electrodes 11 and 21 in the pressure direction are not removed, thereby causing a short circuit" (Page 15, lines 2-8). Thus, because Tsukagoshi teaches the electrodes of the circuit boards are electrically interconnected, i.e. the insulating thermoplastic resin must be at least partially removed, intrinsically the softening point of the insulating thermoplastic resin is lower than an exothermic peak temperature of the insulating adhesive component. In the event it is shown that this is not necessarily true the following rejection would apply. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the softening point of the insulating thermoplastic resin is lower than an exothermic peak temperature of the insulating adhesive component taught by Tsukagoshi as modified by Suga otherwise the insulating coating would remain and there would be no electrical interconnection formed as required.

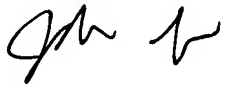
Regarding claim 2, Tsukagoshi teaches the exothermic peak temperature of the insulating adhesive component in the range of 50 to 150 °C. Regarding claim 3, Suga teaches the coating layer made of the insulating thermoplastic resin has a thickness of 0.05 to 2 μm. Regarding claim 4, Tsukagoshi teaches the electroconductive particle is made by forming a metal thin layer onto a surface of a nucleus material. Regarding claim 5, Tsukagoshi as modified by Suga teach the insulting adhesive component further includes thermosetting resin and a curing agent. Regarding claim 8, Suga teaches the insulating adhesive component further includes thermoplastic resin to impart film-forming properties which would have been obvious to include in the insulating adhesive component taught by Tsukagoshi for the same.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John L. Goff** whose telephone number is **(571) 272-1216**. The examiner can normally be reached on M-F (7:15 AM - 3:45 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John L. Goff
Primary Examiner
Art Unit 1791